Artistic Forms and Complexity

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Artistic Forms vs Complexity

• Is there a connection?
• What’s the connection?
Artistic Forms and Complexity Research

• What are “good” questions?
• How can artists and scientists communicate?
• What “style” of working together is likely to produce results?
Focus Areas

• Abstract Art
• Musical works
• Mathematical theorems
COMPLEX SYSTEMS

- Counterintuitive behavior
- Many interactions/feedback loops
- Decentralized decisionmaking
- Indecomposable
Complex Systems: An Example—“Boids”
(Courtesy Craig Reynolds)

Rule I: Separation—steer to avoid crowding neighbors
Boids (cont’d)

**Rule II: Alignment**—steer towards the average heading of neighbors

**Rule III: Cohesion**—steer to move toward the average position of neighbors
Boids Flocking
“31 Flavors” of Complexity

Measures of Complexity
(courtesy Seth Lloyd, MIT)

• Difficulty of Description
• Difficulty of Creation
• Degree of Organization
The Good, the Bad and the Indifferent

What kind of art do people like?

(Source: Painting by Numbers, Komar and Melamid’s Scientific Guide to Art, J. Wypijewski, ed, FSG, NY, 1997)
USA-Best
USA-Worst
FRANCE-Best
FRANCE-Worst
Artistic Forms-I

Is this

More complex than this?

DATA TO PICTURES
Artistic Forms-II

THIS

or

THIS?
(round(log(+y (color-grad(round(+abs (round
(log(+y(color-grad(round(+y(log(invert y) 15.5))
x)3.1 1.86#(0.95 0.7 0.59) 1.35))0.19)x))(log
(invert y)15.5))x)3.1 1.9#(0.95(0.7 0.35)1.35))
0.19)x)
SURVEY RESULTS

LISP LENGTH
A = 186, B = 434, C = 264

COMPLEXITY (24 replies)
A = 42, B = 52, C = 50

AESTHETICS (23 replies)
A = 48, B = 53, C = 37